inseparable from knowledge in its essence, which implies *discrimination of difference or agreement*. We, in common with others, would rather believe that no sensation, not even the simplest, can exist without the elements of cognition being at the same time present in consciousness.

The word perception has, undoubtedly, been used for the most part to signify something which may be termed an intellectualised sensation, and in the purest form of it the amount of mere feeling is reduced to a minimum, whilst the amount of intellectual action involved has undergone a corresponding increase. A perception is a fully elaborated sensation, from which we derive our notion of the nature of an external object—such object being recognised immediately and intuitively, not so much by the mere light of the single present impression, as by the blending of this with revived memories of all other impressions which have, at various times, been related to the one now present. Thus we get a comprehensive notion of the nature of the external object, though a notion which must, to a certain extent, vary with the individual according to the nature of his previous experience. A savage who had never seen gunpowder before, would have a very different notion called up by the sight of it, from that with which a European would be inspired who well knew its composition and properties. To the one it would be a simple black powder, and by him it would be perceived more or less simply as belonging to this category; whilst the other's notion of the same substance would be more complex, containing ideas as to the ingredients of which it is composed, and as to the effects which it is capable of producing by explosion in various ways. But between such states of knowledge, and others which might be regarded as the simplest specimens of mere feelings or sensations, there is not a difference in kind, only one of degree. Any sensation, however simple, can only be recognised as such—can only be revealed in consciousness—inasmuch as it presents a certain quality or qualities, by which it can be differentiated from or classed with previous states of feeling. Therefore even the most simple sensation does necessitate the existence of intellectual activity, since discrimination is the most fundamental mode of intellect. And, in those more complex sensations, generally named perceptions, the only difference, as previously indicated, is that the feeling, as mere feeling, is reduced to its lowest ebb, whilst the amount of intellectual activity, combined in the form of discrimination and memory, has proportionately increased. For by virtue of that association always occurring during the education of the individual between various related sensations, organic and organised relations have been established in the brain, so that a present sense impression rouses simultaneously memories of other past impressions derived from any given object, either by the same or through different avenues of sense; and this blending either actually or potentially of all our past knowledge concerning the same or similar objects with the new impression, goes to constitute our then present perception. "Thus," as we have said elsewhere,* "I see an orange at a distance: this, as an object of visual sense, is simply a rounded yellow area; but past experience has led me to know what are the tactual and muscular sensations usually associated with the sight impressions—how it is really a spherical body with a somewhat rough surface. Then I have learned also that these impressions are usually associated with a certain odour, with a certain taste, a degree of succulence, and certain internal optical characters, including a divisibility into segments, and the possible presence of seeds within. A combination of any of these, or of a host of other revivable impressions, may go to constitute my perception of an orange, and may flash into consciousness more or less simultaneously on the presentation of the object to the visual sense." But as we have previously said, between this comparatively complex resultant, and what would be called a simple sensation, some mere odour or taste, there are other sensations of all intermediate degrees of complexity; and even such simple forms of sensation could not be realised in consciousness without our *knowing* them as sensations possessing such and such characters: to be *known* at all, they must be known qualitatively, and to recognise their qualities is to know them in relation to certain other past impressions which we may have experienced; and thus, in fact, we may look upon it as almost certain, that even the simplest conscious impression can only be known or realised in consciousness so long as intellectual action of some kind is brought to bear upon its recognition.

Hence it may be legitimately maintained, that there is the strongest *à priori* objection to the view which has been so generally held amongst physiologists, that there is an inherent difference between a sensation and a perception, and that there are distinct nerve-centres, by the activity of which such states or acts respectively are called into being. And whilst psychological evidence is thus strongly in favour of the supposition that all sensations, whether simple or complex, do reveal themselves in one organ only, we think we shall also be able to show that physiological evidence is, moreover, quite in harmony with the opinion that the cerebral hemispheres themselves are the sole seats of consciousness, whether for simple sensations or for complex sensations; and that there is no lower organ for "mere sensations" only, as they have been termed—no *sensorium commune* as ordinarily understood, in which impressions reveal themselves in consciousness before impinging upon the cortical grey substance of the cerebral hemispheres.

H. CHARLTON BASTIAN

* "On the Muscular Sense, and on the Physiology of Thinking." (Brit. Med. Journal, May 1869.)

MISTLETOE

WHEN the leaves are rotting on the ground, and the fruit has been converted into cider, the orchards of Herefordshire and Worcestershire still retain something of their verdant hue, and are green with what seems at first to be untimely foliage. But mistletoe cannot be unseasonable at Christmas, and there are those who would be glad to have it in season "all the year round." The supply from the West Midland Counties is practically inexhaustible, for it has been calculated that from 30 to 90 per cent. of the apple-trees are infested by this parasite, two or three boughs of which may sometimes be seen dependent from some old cankered limb. Its presence is at once the cause and the sign of incipient decay. A struggle for life between the tree and its enemy has begun, and, if the pruning-knife or the demands of Christmas do not interfere, the mistletoe will slowly and surely exhaust the branch upon which it grows, penetrating further and further into the wood as the supply of sap recedes, and ever sending forth fresh roots in place of those which were overpowered at first. The severity of the struggle between these seemingly unequal foes may be sometimes seen in the strange fantastic contortions into which the branches twist themselves, and sometimes in the withered aspect which the whole tree wears when, as Shakespeare says, it stands

> Forlorn and lean,
> O ercome with moss and baleful mistletoe.

The entire existence of this parasite is full of interest, even though the mystery of its birth has been removed. Modern research confirms the accuracy of the old distich which expresses thus its origin:—

> The thrush, when he pollutes the bough,
> Sows for himself the seeds of woe;

and perhaps the increase of mistletoe may be partly attributable to the disuse of its product (bird-lime), and the greater immunity which thrushes in consequence enjoy. But those who desire to do so may easily propa-

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gate mistletoe without their intervention. All that is necessary for success is to introduce very carefully a few seeds into a shallow notch made in the bark of an apple-tree, and bind it round delicately with bass or damp moss. The apple-tree is the surest stock, for, though it is found elsewhere, yet there is a certain constancy in the apparent caprice shown by the mistletoe in the selection of its victims. It occurs frequently on the poplar, hawthorn, willow, and lime; never on the beech, holly, cherry, and walnut; rarely on the chestnut and pear, and only in some few known instances upon the oak. Probably the rarity of its occurrence on the oak contributed to the reverence with which, under those circumstances, it was regarded by our British ancestors. To them a mistletoe-oak was a tree beloved of heaven—a symbol of life and death—a promise of renewal of strength to the leafless monarch of the glade. When the New Year's festival came round, the Arch-Druid, clothed in white, mounted the tree, and cut the mistletoe with a golden sickle. As it fell into the white cloth held to receive it, two white bulls also fell to the ground as sacrificial victims; and the prayer went forth from the Druid's lips that God would prosper his gift, and make it a charm potent against poison, and a certain cure for sterility.

It is curious to notice how this traditional connection between the mistletoe and New Year's Day, and a belief in its virtues, have survived among the natives of the Western Marches. In Herefordshire, at any rate, no mistletoe enters into the Christmas decorations of house and church; but on New Year's Eve, many of the old farmers and cottagers still go forth to cut their bough, and hang it up with all solemnity as the clock strikes twelve. Nor are the medical properties of the mistletoe forgotten by them. Before turnips were extensively cultivated, old Tusser's precept was regularly followed:—

> If snowe doe continue, sheepe hardly that fare
> Crave mistle and ivie for them for to spare.

And even now faith in the virtues of the plant (which is in fact a gentle tonic) may here and there be found. "What is mistletoe good for?" asked Dr. Bull of a Herefordshire rustic. "That do depend on what tree it comes from," was the reply. "It be a very fine thing for fits. My father had the 'leptic fits for many years, but nothing never did him no good like mistletoe from the haw, mixed with wood-laurel, and he took nothing else. They do tell me that mistletoe from the maiden ash be a fine thing for convulsives. I know when you get it from the maw-pell it's good for animals. It's capital for sheep as don't go on well at lambing-time, and for cows too. That as comes from the apple-tree and poplins is the best to hang up in the house on New Year's Day for good luck through the year; but a many people use any that comes first. A piece of mistletoe from the haw—*from the haw*, sir—chopped in pieces and given to a cow after calving, will do her more good nor any drench you can give her." Sir Thomas Browne mentions the practice of thus administering it among his "Vulgar Errors," but at least it is one not likely to be attended with evil consequences.

The reason of the exclusion of mistletoe from church decoration may be gathered from what has already been said, and to this we must add, that its appearance there might be likely to suggest something more ardent than "the kiss of peace." But in hall and cottage alike the mistletoe reigns supreme at this season, and in London and other great towns the artisan spends a small portion of his Christmas wages in the purchase of a few sprigs wherewith to decorate his house and bring good luck to its inmates. From Herefordshire and Worcestershire between 200 and 300 tons of mistletoe are annually exported, and during the present week nearly every train from the West Midland district bears with it a truck-load of branches, fraught with we know not what romance, and bright with berries wherein is contained the destiny of the coming year.

*THE MIDNIGHT SKY**

SURELY if ever there were an Astronomy made easy, here it is: if ever there were a sensible Christmas present for a boy, here it is. In fact, it is impossible to commend Mr. Dunkin or the Religious Tract Society too highly for the work which they have jointly produced. It is an honest, scientifically sound, beautiful book, with appeals both to the eye and the mind: one in which the magnificence of the heavens and the deep teachings of modern science go hand in hand, until at last the unscientific reader will certainly find himself deeply interested in the discussion of questions, and the following-out of reasonings, which but a few short years ago were generally supposed to furnish day-dreams to solitary astronomers, who dwelt in towers far removed from the ken of their fellows, and still further removed from their pursuits and interests.

That such a state of things is past and gone, and that the glories of the firmament are now eagerly revelled in by thousands, ay, and even tens of thousands, is in the main owing to the publication of such books as the "Midnight Sky," and the many handy series of star-maps which Mr. Proctor and others have produced.

The book contains carefully drawn views of the midnight sky, at London, looking north and south, for every night in the year. These views are accompanied in each case by an index-map giving the names of the principal stars. In order that these maps may be utilised at any other hour than midnight, Mr. Dunkin has provided the observer with a tabular statement which gives at one view the hour and month when each diagram of the series is available for comparison with the sky. The descriptions appended to these maps are clearly written in a style which will not be found beyond the comprehension of the least scientific reader. Mr. Dunkin next gives a description of the midnight sky of the southern hemisphere, in the months of February, May, August, and November. Following these articles and star-maps, we find an interesting account of the constellations, general notes on the milky way, the magnitudes, scintillation and colour of the stars, analysis of solar and stellar light, the observatories in the southern hemisphere, and remarks on nebulæ and clusters. Notes on the sun, moon, and earth, the major and the minor planets, succeed, and the work is concluded by a full account of meteors and shooting stars, a copious index serving to give increased usefulness to the book.

The Religious Tract Society has done wisely in entrusting the writing of these familiar notes to an astronomer of such high ability as Mr. Dunkin. Not only have we at once a guarantee of correctness in the facts themselves, but there is insured that freedom of style which only an intimate acquaintance with a subject can give, and, in the case of such a far-reaching and intricate science as astronomy, this consideration is of high importance—witness the flabby books written by incompetent men.

In the latter part of the work, which forms a sort of treatise on astronomy, Mr. Dunkin dwells among other matters on solar eclipses, and gives several very interesting anecdotes connected with them which we do not remember to have seen in print before. In the notes on the sun we detect a little hasty writing, which the author will do well to correct in subsequent editions. In the first place the hydrogen is the sun's chromosphere, is not in a state of *combustion* but of *incandescence*; and M. Le Verrier gets credit for an assertion he made in 1860, which, had Mr. Dunkin printed the context, would be evidently absurd, according to our present knowledge. Father Secchi is credited too with having proved satisfactorily the hollow

* "The Midnight Sky." Familiar Notes on the Stars and Planets. By Edwin Dunkin, F.R.A.S., Royal Observatory, Greenwich. Thirty-two Star-maps and other Illustrations, pp. 326. Religious Tract Society.

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